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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/595,095	02/09/2006	Kishore Udipi	PA1366 US	2491

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MEDTRONIC VASCULAR, INC.
IP LEGAL DEPARTMENT
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EXAMINER	
GULLEDGE, BRIAN M	

ART UNIT	PAPER NUMBER
1612	

NOTIFICATION DATE	DELIVERY MODE
11/19/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

rs.vasciplegal@medtronic.com

Office Action Summary	Application No.	Applicant(s)	
	10/595,095	UDIPI ET AL.	
	Examiner	Art Unit	
	Brian Gulledge	1612	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 August 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *6/6/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Applicant's election without traverse of the species of vascular stent in the reply filed on August 31, 2009 is acknowledged.

Typographical Issue in the Claims

Claims 7-8 and 19-20 recite a coating "according to *anyone* of claims" 1 through 6 or 13 through 18, respectively. This appears to be a typographical error, and should likely read "according to *any one* of" the subsequent claims.

Claim Rejections - 35 USC § 112, Written Description

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 3-8 and 15-16, and 18-20 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claims 3 and 15 recite a terpolymer comprising monomer subunits "consisting essentially of" the three following monomers. The term "consisting essentially" is inadequately described by the instant specification, since it fails to contemplate the

exclusion of any particular ingredients as implied therein; nor does it provide any criteria for determining if a given ingredient "materially affects the basic or novel characteristics of the invention".

Claims 14 and 19 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The description requirement of the patent statute requires a description of an invention, not an indication of a result that one might achieve if one made that invention. See, e.g., *In re Wilder*, 22 USPQ 369, 372-3 (Fed. Cir. 1984). (Holding that a claim was not adequately described because the specification did 'little more than outline goals appellants hope the claimed invention achieves and the problems the invention will hopefully ameliorate.')

Mere indistinct terms (such as parylene "derivative" used herein), however, may not suffice to meet the written description requirement. This is particularly true when a compound is claimed in purely functional terms. See *Univ. of Rochester v. G.D. Searle*, 69 USPQ2d 1886 (CAFC 2004) at 1892, stating:

> The appearance of mere indistinct words in a specification or a claim, even an original claim, does not necessarily satisfy that requirement. A description of an anti-inflammatory steroid, i.e., a steroid (a generic structural term) described even in terms of its functioning of lessening inflammation of tissues fails to distinguish any steroid from others having the same activity or function. A description of what a material does, rather than of what it is, usually does not suffice.... The disclosure must allow one skilled in the art to visualize or recognize the identity of the subject matter purportedly described. (Emphasis added).

Conversely, a description of a chemical genus will usually comprise a recitation of structural features common to the members of the genus, which features constitute a substantial

portion of the genus. See *Univ. of Calf. V. Eli Lilly*, 43 USPQ 2d 1398, 1406 (Fed. Cir. 1997). This is analogous to enablement of a genus under Section 112, ¶ 1, by showing the enablement of a representative number of species within the genus.

A chemical genus can be adequately described if the disclosure presents a sufficient number of representative species that encompass the genus. *If the genus has substantial variance, the disclosure must describe a sufficient number of species to reflect the variation within that genus*. See MPEP 2163. The MPEP lists factors that can be used to determine if sufficient evidence of possession has been furnished in the disclosure of the Application. These include the level of skill and knowledge in the art, partial structure, physical and/or chemical properties, functional characteristics alone or coupled with a known or disclosed correlation between structure and function, and the method of making the claimed invention. Disclosure of any *combination of such identifying characteristics that distinguish the claimed invention from other materials* and would lead one of skill in the art to the conclusion that the applicant was in possession of the claimed species is sufficient. MPEP 2163.

Here, the specification does not provide a reasonably representative disclosure of useful derivatives of parylene generally, a potentially huge genus inclusive of many different compounds having widely divergent structures and functions. Specifically, the specification discloses no species, and thus does not provide a reasonably representative number of species of the genus in its claimed scope because no readily apparent combination of identifying characteristics is provided.

Claim Rejections - 35 USC § 112, 2nd Paragraph

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 4, 7-8, 16, and 19-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 4 and 16 recite the relative weight percentages of the monomer subunits of the terpolymer (which, being relative, need to add up to 100%). The range of values for the alkyl methacrylate is as high as 75%. However, at this amount, having the smallest values for the other monomer subunits would give a total relative amount of 101%. As these are relative amounts that need to add up to 100%, the range recited is indefinite.

Claims 6-8 and 18-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 6 and 18 recite that the alkyl methacrylate is selected from the group consisting of "methyl, ethyl, propyl, butyl, pentyl, and hexyl." None of the species recited are species of alkyl methacrylates. They are rather species of alkyl groups.

Claims 9 and 21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 9 and 21 recite the use of "anti-proliferatives including" and "macrolide antibiotics including FKBP 12 binding compounds." The phrase

"including" renders the claim indefinite because it is unclear whether the limitation(s) following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

Claims 11 and 23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 9 and 21 recite "macrolide antibiotics including FKBP 12 binding compounds." Claims 11 and 23, which depend from claims 9 and 21, respectively, recite "wherein said FKBP 12 binding compound is a macrolide antibiotic." It is unclear if this claim is further limiting, as either the genus of "macrolide antibiotics" is broader than genus of "FKBP 12 binding compounds," or the genus of "FKBP 12 binding compounds" is broader than the genus of "macrolide antibiotics."

Claims 12 and 24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claims recite that the macrolide antibiotic is "A-19 or A-20." These are not macrolide antibiotics, nor does the specification or claims define what these terms mean, and as such the claim is indefinite.

Claims 14 and 19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The term "derivative" is indefinite because it is unclear how far one can deviate from the parent compound without the "derivative" being so far

removed therefrom as to be a completely different compound. See the related rejection in the "Written description" section *supra*.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-2, 7-13, and 19-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lyu et al. (US Patent Application Publication 2004/0047911). Lyu et al. teaches vascular stents that are coasted with a polymeric top-coat comprising an active agent, the co-polymer poly(ethylene-co-(meth)acrylate) and a second polymer (paragraph [11], lines 1-8). A preferred combination disclosed has the terpolymer polyvinyl butyral-co-vinyl alcohol-co-vinyl acetate employed as the above "second polymer" (paragraph [65], lines 1-9). These two polymers have solubility parameters of 16.9 and 23.1 $J^{1/2}/cm^{3/2}$, respectively (page 6, table 1), and thus a blend of the two will have a solubility parameter between 15 and 25 $J^{1/2}/cm^{3/2}$. This value is also approximately equal to the solubility parameter of rapamycin, a macrolide antibiotic (17.5 $J^{1/2}/cm^{3/2}$). Lyu et al. teaches this coating on a substrate, and that the substrate is pretreated with a polymeric undercoat (paragraph [75], lines 1-7). Thus, Lyu et al. teaches all of the limitations of instant claims 1 and 13.

The specific combination of features claimed is disclosed within the broad genera of polymeric blends and articles coated taught by the Lyu et al. but such "picking and choosing"

within several variables does not necessarily give rise to anticipation. *Corning Glass Works v. Sumitomo Elec., 868 F.2d 1251*, 1262 (Fed. Circ. 1989). Where, as here, the reference does not provide any motivation to select this specific combination of variables, anticipation cannot be found.

That being said, however, it must be remembered that "[w]hen a patent simply arranges old elements with each performing the same function it had been known to perform and yields no more than one would expect from such an arrangement, the combination is obvious". *KSR v. Teleflex*, 127 S.Ct. 1727, 1740 (2007) (quoting *Sakraida v. A.G. Pro*, 425 U.S. 273, 282 (1976)). "[W]hen the question is whether a patent claiming the combination of elements of prior art is obvious", the relevant question is "whether the improvement is more than the predictable use of prior art elements according to their established functions." (*Id.*). Addressing the issue of obviousness, the Supreme Court noted that the analysis under 35 USC 103 "need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ." *KSR v. Teleflex*, 127 S.Ct. 1727, 1741 (2007). The Court emphasized that "[a] person of ordinary skill is… a person of ordinary creativity, not an automaton." *Id.* at 1742.

Consistent with this reasoning, it would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made to have selected various combinations of polymeric blends and articles coated from within the disclosure of Lyu et al. to arrive at compositions "yielding no more than one would expect from such an arrangement".

Instant claim 2 recites a range for the glass transition temperature of the coating, and instant claims 7 and 19 recite amounts for the polymers in the blend. Lyu et al. does not teach

these values explicitly, though Lyu et al. does teach that the glass transition temperatures is used to guide the skilled artisan to select an appropriate combination of the component polymers, and the amounts of the polymers selected are based on the desired dissolution time for the drug (paragraph [27]). Thus, the recited values would have been *prima facie* obvious to one of ordinary skill in the art as the skilled artisan would have optimized the blend to achieve a desired rate of delivery of the drug, and thus meet these limitations.

Instant claims 8 and 20 recite that the terpolymer has a higher glass transition temperature that the bipolymer, and Lyu et al. teaches this relationship (paragraph [65], lines 1-3). Instant claims 9-12, which depend from instant claim 1, recite further limitations to the bioactive agent. Instant claim 1 does not recite the inclusion of a bioactive agent, but rather only that the total solubility parameter of the blend is approximately equal to said bioactive agent. Thus, while Lyu et al. does not teach the inclusion of rapamycin, this ingredient is not required by the claims. Instant claim 21 does require a bioactive agent, and Lyu et al. teaches the use of anti-proliferative agents in the coating (paragraph [42]).

Claims 14 and 22-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lyu et al. (US Patent Application Publication 2004/0047911) as applied to claim 13 above, and further in view of Sirhan et al. (US Patent Application Publication 2002/0082677). Lyu et al. teaches all of the limitations of instant claim 14 except for the stent having a parylene coating. Lyu et al. also teaches all of the limitations of instant claims 22-24 except for the inclusion of "A-19 as the drug. The term "A-19" is going to be assumed to refer to rapamycin for the purpose of this prior art rejection (page 30 of the instant specification suggests that this is

the intended laboratory designation for rapamycin). Lyu et al. does disclose using anti-proliferatives as the active agent (paragraph [42]).

Sirhan et al. discloses vascular stents (paragraph [3], lines 1-6). Sirhan et al. discloses that the stents may comprise a barrier layer formed over the substrate structure to help control the release rate, such as a parylene barrier (paragraph [24], lines 1-12). Sirhan et al. further teaches the stents can be used to deliver immunosuppressant active agents, such as rapamycin (paragraph [22], lines 1-3).

Therefore, it would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made to have used the stent coating taught by Lyu et al. in order to provide a stent for delivering rapamycin, as the coating taught by Lyu et al. would allow the skilled artisan a method to control the rate of delivery of the active agent by matching the solubility parameter values of the drug and the polymeric blend. Further, it would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made to have used parylene to coat the substrate of the stent disclosed by Lyu et al., as this would allow the skilled artisan to further control the rate of release of the bioactive agent.

Claims 1-13 and 15-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Benz et al. (US Patent Application Publication 2003/0162905) in view of Shalaby et al. (US Patent Application Publication 2003/0199964) and Lyu et al. (US Patent Application Publication 2004/0047911). Benz et al. discloses copolymers for coating medical devices (paragraph [2], lines 1-4). The copolymer is an A_nB block copolymer. The "A" block comprises vinyl pyrrolidone as at least one of the monomers in order to provide suitable lubricity to the

device (paragraph [34], lines 1-8). The "A" block also can comprise other monomers in addition to the vinyl pyrrolidone, such as methacrylic esters (paragraph [35], lines 1-7). Benz et al. teaches that the "B" block is designed to be compatible with, and adhere to, the surface to be coated (paragraph [40], lines 1-8). Benz et al. further teaches mixing the above copolymer with secondary polymers to further modify the surface coating (paragraph [31], lines 1-11). However, Benz et al. does not disclose the use of poly(vinyl acetate) for the "B" block, nor does Benz et al. disclose using a copolymer that comprises an alkyl methacrylate and vinyl acetate in the coating composition, as recited by instant claim 3.

Shalaby et al. discloses polymeric coated stents with a bioactive agent dispersed within the coating (abstract, lines 1-5). The stent disclosed addresses the problems that the drug-containing polymer may not adhere to the stent (paragraph [5], lines 8-11) and that the drug may elute too quickly (paragraph [5], lines 77-13). Shalaby et al. teaches that the coating comprises a copolyester made from vinyl acetate and butyl methacrylate (paragraph [9], lines 1-10), and that the individual blocks affect the properties of the whole polymer (paragraph [28], lines 1-17). Shalaby et al. further teaches that the vinyl acetate block (the "second segment") provides metal-adhering characteristic to the coating (paragraph [9], lines 1-6).

Therefore it would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made to have made the A_nB block copolymer disclosed by Benz et al. with vinyl acetate as the "B" block. Shalaby et al. teaches that this block of a copolymer allows for adhesion of a polymeric coating to a stent, and Benz et al. teaches that this block in the disclosed polymer controls adhesion of the coating to the stent. And it would also have been *prima facie* obvious to have prepared a coating with both the terpolymer of Benz et al. and the

copolymer taught by Shalaby et al., as they are both used for providing drug-eluting coatings for stents wherein the coating has improved adhesion to the stent. Generally, it is *prima facie* obvious to combine two compositions, each of which is taught by the prior art to be useful for same purpose, in order to form a third composition to be used for the very same purpose. The idea for combining them flows logically from their having been individually taught in the prior art. See MPEP 2144.06.

The above references do not discuss the average solubility parameter values for the blend of polymers or the drug. Lyu et al. discusses blends of polymers that are used as coatings for medical devices, such as stents (paragraph [5], lines 1-7). Lyu et al. teaches that by controlling the relative amounts of the polymers in the blend and the glass transition temperatures and solubility parameters of the individual polymers (controlled by the monomers) that the dissolution time of the active agent can be controlled, thus controlling the rate of release (paragraph [27], lines 1-19). Lyu et al. further teaches that the difference between the solubility parameter of the active agent and the solubility parameter of the polymeric blend is no more than 3 $J^{1/2}/cm^{3/2}$ (paragraph [66]). Thus, Lyu et al. provides motivation for optimizing the relative amounts of the polymers in the blend taught by Benz et al. and Shalaby et al. This coating composition renders the coating composition recited by instant claims 1-12 *prima facie* obvious, and the taught coated stent renders the stent recited by instant claims 13 and 15-20 *prima facie* obvious. Shalaby et al. also teaches that the bioactive agent present in the coating is an antiproliferative agent (paragraph [13], lines 1-2), thus teaching the limitation recited by instant claim 21.

Claims 14 and 22-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Benz et al. (US Patent Application Publication 2003/0162905), Shalaby et al. (US Patent Application Publication 2003/0199964), and Lyu et al. (US Patent Application Publication 2004/0047911) as applied to claim 13 above, and further in view of Sirhan et al. (US Patent Application Publication 2002/0082677). The coated stent taught by Benz et al., Shalaby et al., and Lyu et al. teaches all of the limitations recited by the instant claims except for the stent having a parylene coating. Lyu et al. also teaches all of the limitations of instant claims 22-24 except for the inclusion of "A-19 as the drug. The term "A-19" is going to be assumed to refer to rapamycin for the purpose of this prior art rejection (page 30 of the instant specification suggests that this is the intended laboratory designation for rapamycin). Lyu et al. does disclose using anti-proliferatives as the active agent (paragraph [42]).

Sirhan et al. discloses vascular stents (paragraph [3], lines 1-6). Sirhan et al. discloses that the stents may comprise a barrier layer formed over the substrate structure to help control the release rate, such as a parylene barrier (paragraph [24], lines 1-12). Sirhan et al. further teaches the stents can be used to deliver immunosuppressant active agents, such as rapamycin (paragraph [22], lines 1-3).

Therefore, it would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made to have used the stent coating taught by Benz et al., Shalaby et al., and Lyu et al. in order to provide a stent for delivering rapamycin, as the coating taught by Benz et al., Shalaby et al., and Lyu et al. would allow the skilled artisan a method to control the rate of delivery of the active agent by matching the solubility parameter values of the drug and the polymeric blend. Further, it would have been *prima facie* obvious to one of ordinary skill in the

art at the time the invention was made to have used parylene to coat the substrate of the stent, as this would allow the skilled artisan to further control the rate of release of the bioactive agent.

Conclusion

No claims are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian Gulledge whose telephone number is (571) 270-5756. The examiner can normally be reached on Monday-Thursday 6:00am - 3:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frederick Krass can be reached on (571) 272-0580. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

BMG

/Frederick Krass/

Supervisory Patent Examiner, Art Unit 1612